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BOOK REVIEW

Dariusz Gatarek, Przemyslaw Bachert und Robert Maksymiuk (2006): The LIBOR Market Model in Practice

Wiley Finance, approx. 155 CHF, 270 pages

Rico von Wyss

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This book is not an introduction to derivatives or derivatives' pricing. It is not about interest rate derivatives and, additionally, you will not like it, if it is your first book on the LIBOR market model. This book is about the implementation of this model, about approximations, calibrations and algorithms in order to price interest rate derivatives.

The book consists of three parts:

Part 1 covers the theoretical background of the model. It presents briefly the fundamentals of probability spaces, stochastic processes and simulation. The formulas for the Heath-Jarrow-Morton and the LIBOR market model are given in a nutshell with a somehow unmotivated excurse to other interest rate models. Off course there is a chapter on the swap market model. The modeling of volatility smiles and the single-factor LIBOR market model applied on constant maturity swaps conclude the first part. You may well find other publications that will give you a deeper insight into the theoretical foundations of interest rate models.

The real contribution of the book to the existing literature is the hands-on description of the calibration algorithms in the second part: Starting out from discount factors and implied volatilities the authors show with consistent numerical examples the stripping of caplet volatilities and the calibration to caplets. This is extended to non-parametric calibration algorithms and to swaptions describing thoroughly each single step in the respective algorithm. For the separated calibration approach to the full set of swaptions with an optimization algorithm even the Matlab code is provided. Other presented algorithms that calibrate to swaptions only are the locally single factor approach, the calibration with historical correlations of forward rates, and the calibration to co-terminal swaptions. Once again the methods are accompanied by numerical examples which simplify the understanding of the techniques considerably. Another chapter is

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devoted to the simultaneous calibration to caps and swaptions. The authors compare parametric and non-parametric approaches and clearly show the reason for the move of the industry toward the latter.

From the calibration it is a small step to the construction of trees in the last part. The construction of binomial and trinomial trees with different approximations are compared and it turns out that the Brownian bridge and the combined Brownian bridge-predictor–corrector methods minimize approximation errors. But the book goes further and includes a rather new approach, the LIBOR Functional Markov Model, that constructs the term structure numerically. By incorporating the calibration into the model, this method circumvents the use of inefficient bushy trees or the tree approximation. The book concludes with the pricing of American and Bermudan options employing Least Squares Monte Carlo and addresses the questions of optimal stopping. Numerical examples show clearly the best algorithm and ease the understanding.

With "The LIBOR Market Model in Practice" the reader with some experience in Matlab programming and the theoretical background from an interest rate derivatives lecture will be able to calibrate the model to cap or swaptions prices, to construct trees and finally price a range of American or Bermudan interest rate derivatives. The book is addresses towards practitioners who will have to implement the model and to work with it in daily business. Read this book as number three *after* Hull's "Options, Futures, and other Derivatives" and *after* Brigo and Mercurio's "Interest Rate Models—Theory and Practice"!